

DoD Space Planning Criteria for Health Facilities

Emergency and Ambulance Services

3.5.1. PURPOSE AND SCOPE:

This section provides guidance for the space planning criteria for emergency and ambulance activities in DoD medical facilities. This criteria includes four major elements: (1) definitions which clarify the level of complexity of urgent/emergent care provided, in accordance with DoD and generally accepted standards of practice, and which clarify intended function of critical treatment and support spaces; (2) policies which address overriding planning considerations; (3) a listing of data required to accurately program space requirements; and, (4) specific space planning criteria/formulas for determining spaces required to support Emergency and Ambulance Services.

3.5.2. DEFINITIONS:

Emergency Services Levels of Care:

Level I Care - “A Level I emergency medical department or service offers comprehensive emergency care 24 hours a day, with at least one physician experienced in emergency care on duty in the emergency care area. There must be in-hospital physician coverage by members of the medical staff or by senior-level residents for at least medical, surgical, orthopedic, obstetric, gynecological, pediatric, and anesthesiology services. When such coverage can be demonstrated to be met suitably through another mechanism, an equivalency will be considered to exist for purposes of compliance with the requirement. Other specialty consultation must be available within approximately 30 minutes. Initial consultation through two-way voice communication is acceptable (from DoD 6015.1-M).” This definition is consistent with the definition of Level I care in the Accreditation Manual for Hospitals (AMH), Joint Commission on Accreditation of Healthcare Organizations, 1994; and corresponds to the American Institute of Architects (AIA) definition for full-scale definitive emergency management in Guidelines For Construction and Equipment of Hospital and Medical Facilities, 1992-1993.

Level II Care - “A Level II emergency department or service offers emergency care 24 hours a day, with at least one physician experienced in emergency care on duty in the emergency care area. There must be specialty consultation available within approximately 30 minutes by members of the medical staff or by senior-level residents. Initial consultation through two-way voice communication is acceptable. The hospital’s scope of services must include in-house capabilities for managing physical and related emotional problems, with provision for patient transfer to another facility when needed (DoD 6015.1-M).” This definition is consistent with the AMH and corresponds to the AIA definition for definitive emergency management.

Level III Care - “A Level III emergency department or service offers emergency care 24 hours a day, with at least one physician available to the emergency care area from within the hospital, who is available immediately through two-way voice communication and in person within approximately 30 minutes through a medical staff call roster. Specialty consultation must be available by request of the attending medical staff member or by transfer to a designated hospital where definitive care can be provided (DoD 6015.1-M).” This definition is consistent with the AMH and corresponds to the AIA definition for initial emergency management, but provides for a higher level of 24-hour operation care than Level IV emergency services.

Level IV Care - A Level IV emergency department or service offers reasonable care in determining whether an emergency exists, renders lifesaving first aid, and makes appropriate referral to the nearest organizations that are capable of providing needed services, with at least one physician available immediately through two-way voice communication and in person within 30 minutes through a medical staff call roster. A Level IV emergency service may not necessarily operate 24 hours a day, and may not have a dedicated ambulance service supporting it. A Level IV facility may also operate as a walk-in acute care clinic. This definition is consistent with generally accepted standards of practice in DoD MTFs (DoD 6015.1-M does not include a definition of Level IV care) and the AMH, and corresponds to the AIA definition for initial emergency management.

Ambulance Dispatch - Space is intended to house all emergency radio communications equipment and grid maps of base/post and area supported by the regional emergency response network.

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Ambulance Garage - Enclosed garage space is provided to protect operational ambulances (not WRM/DEPMEDS assets) from the effects of severe weather. A flammable/hazardous storage room is typically built into the garage to store supplies of oil, refrigerant, other liquids and cleaning products used for normal daily maintenance of ambulances.

Ambulance Reception/Team Center - Central control point for patients brought in by ambulance, and supervision point/work center for all treatment activities. Center includes work/charting space for provider, nursing and transport personnel.

Ambulance Service - An ambulance service to respond to emergency calls on a military installation, to associated military family housing areas, and to designated other locations is usually established in conjunction with emergency services departments. Generally, a 24-hour ambulance service is established to support Levels I, II, and III care, while Level IV care facilities may have either 24-hour, limited hours, or no ambulance service. Typically, the ambulance service is also used to transport patients to referral facilities for more definitive care and for selected treatments or diagnostic procedures. The ambulance service may also have specific responsibilities associated with regional emergency response plans. Ambulance services are staffed by specially trained emergency care medical technicians/corpsmen who may also be required to assist with provision of emergency care in the MTF when not actively participating in an ambulance emergency response/transport.

Ambulance Shelter - Open, carport -style, shelters are provided to protect operational ambulances (not WRM assets) from adverse effects of weather such as rain, hot sun, etc., in locations where weather conditions are relatively mild and do not require totally enclosed protection. A flammable/hazardous materials shed is typically attached to the shelter to store supplies of oil, refrigerant, other liquids and cleaning products used for normal daily maintenance of ambulances.

Emergency Care Reference Library - Accommodates storage of a limited number of essential emergency care reference books and data sources (e.g., on-line poison control and emergency management/drug interaction hotlines/help lines, CD ROM references, etc.). Library may be consolidated with Ambulance Reception/Team Center or Staff Lounge, providing security of reference resources is assured. Telemedicine capability may be incorporated into the reference library area.

Emergent/Critical Patient – Patient with symptoms of an illness or injury associated with a high probability of mortality or morbidity. Quick or immediate medical intervention is required to prevent further instability. These patients are treated in a trauma room.

Emergency Exam Room – A multipurpose room used for the assessment, exam, minor treatment and specialty care of urgent and non-urgent patients. This room can accommodate “minor” procedures such as suturing and suture removal. This room can also be used for casting. With the addition or substitution of some equipment items, this room can be used for OB/GYN, ENT, pediatric, orthopedic and other special patient care.

Emergency Services – Those healthcare services provided to evaluate and treat medical conditions of recent onset and severity that would lead a prudent layperson, possessing an average knowledge of medicine and health, to believe that urgent and/or unscheduled medical care is required.

Family Consultation/Interview Room - Intended to provide a quiet, sound-controlled area for consultation with family members of critically ill/injured patients, bereavement, and sensitive interviews by Security/Military Police or other personnel authorized to conduct inquiries into possible incidents of assault, rape, child or spouse abuse. Room may also double as a Secured Holding Area.

Full-Time Equivalent (FTE): A work force equivalent to one individual working full time for a specific period, which may be made up of several part-time individuals or one full-time individual. This will include everyone working in the facility; military, civilian and contractor personnel.

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Isolation Suite – Provided for seclusion of patients with infectious diseases or compromised immune systems.

Medi-prep Room – An enclosed space with door to accommodate preparation of medications for patients, including a limited amount of controlled drugs, as ordered by authorized providers.

Non-Urgent Patient – Patient with symptoms of an illness or injury that are not life threatening with a low probability of morbidity. Near-term medical intervention is desirable but not required. After initial assessment and/or treatment, these patients could be referred to a clinic location for follow-up care. Non-urgent patients are treated in an exam room.

On-Call Sleeping Suite - Bedroom, with dedicated toilet/shower. Space is provided as a quiet resting space only if On-Call personnel must remain in-house for a 24-hour period, or are normally required to work more than a 15-hour shift.

Patient Decontamination Room - Used to decontaminate, prior to treatment, a patient who has been exposed to chemical or biological hazardous substances as a result of an industrial/other accident. It is sized to allow entrance of a gurney-borne patient and attendants to the room from the exterior of the building; decontamination of the patient in the room; and exit of patient & attendants through another door into the emergency care area. The room is not intended to support mass patient decontamination as a result of acts of war or terrorism. A self-contained, independent, closed system for drainage/disposal of contaminants will be designed into this space. A negative air flow and ventilation system separate and distinct from the hospital system will be designed into the room. (See AIA Guidelines)

Preceptor/ Consult Room - A location is required for residents in training to be able to discuss cases in private with supervising faculty physicians (preceptors.). These discussions occur during the course of a patient visit, requiring proximity to exam room areas. In clinic configurations with staff physician offices clustered near exam rooms, precepting may be feasible from the faculty physician's own office and not from a dedicated central preceptor room. Note that any space provided for precepting must afford privacy from eavesdropping patients and passers-by ... hence an open area accessible by non-staff is NOT acceptable

Secured Holding Room - Provided in Level I and II facilities for special patient security, patient and staff safety, and soundproofing needs. Also serves as psychiatric exam room.

Security/Communications Center - Space is provided to house emergency/security and fire alarm control panels. May be combined with ambulance dispatch if full-time security personnel are not assigned to the Emergency Department and no other appropriate department is staffed 24-hours a day.

Security Control Area - Space provides a secure entry/control point into Emergency Departments in locations where it has been demonstrated that there is a high probability of outbursts of violence directed at patients or staff, and where dedicated Emergency Department Security Personnel are authorized.

Trauma Room – At least one Trauma Room is required for all Emergency Services. These rooms are intended to be used for complex emergency trauma/cardiac arrest treatment, and are designed much like an operating room in the event that emergency surgical resuscitation is required. Trauma Rooms should be sized and designed to accommodate two patients during periods of peak demand.

Triage/Screening Area – Accommodates initial assessment and triage of patient conditions. Initial patient history and vital signs may be taken in this space.

Urgent Patient – Patient with symptoms of an illness or injury that is serious but not life threatening with a moderate probability of increasing morbidity. Near-term medical intervention is required, usually within a few hours of arrival to the ED. If wait time prior to medical treatment for these patients is excessive some patients may migrate to emergent/critical status. Urgent patients are usually treated in an exam room.

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Walk-in Patient Reception/Control – Area is the central reception/control point for walk-in patients and for patient/Family waiting. Space provides location for initial patient sign-in activities and technician/corpsman charting.

3.5.3. POLICIES:

Level of Emergency Care Designation - Determining the level of emergency care to be provided at a particular location, and hours of operation of an emergency service, is the responsibility of the executive committee of the medical staff of the military medical treatment facility in consultation with appropriate higher levels of command.

Operation of Ambulance Service - Determination of scope of ambulance service and hours of operation is the responsibility of the MTF executive staff (or governing body) and EMS director in consultation with higher levels of command and regional emergency management authorities, as appropriate.

Patient Observation/Holding - Establishing policies pertaining to the maximum length of time a patient may be kept in an emergency department/service observation/holding bed before being admitted as an inpatient, referred for definitive care or discharged (IAW JCAHO AMH standards) is the responsibility of the MTF executive committee of the medical staff in consultation with appropriate higher levels of command.

Number of Exam Rooms – The number of exam rooms planned for an emergency department will be determined using a Poisson process with a capacity factor of 95.0 percent. The arrival rate used in the Poisson process calculation will be:

- a) 90.0 percent of the average number of projected ED patient visits per day ($0.90 \times$ the number of projected annual visits/365) OR
- b) The projected average number of urgent and non-urgent patients visits per day as determined by statistical analysis of recent historical data.

The service time used in the Poisson process calculation will be:

- a) 2.0 hours OR
- b) the average exam time for urgent and non-urgent patients as determined by statistical analysis of data from the most recent one year time period. The exam time is defined as the time from patient entry to an exam room to patient disposition by the provider (Exam time does not include the initial wait time prior to patient entry to an exam room and does not include the post exam wait time from disposition to discharge).

A primary goal of emergency department exam room planning is to provide maximum flexibility regarding the type of patients and the care provided in each room. Exam rooms should be planned to accommodate different types of patients during peak periods with minor equipment changes in a standard exam room. Special care requirements (e.g. OB/GYN, pediatrics, ENT, orthopedic, etc.) should be accommodated in a standard exam room by modifying the equipment in the room (provide a multipurpose treatment table/bed with OB/GYN care features, provide an exchange cart with pediatric instrumentation, etc.) or by modifying the room finishes (color scheme and decorations for pediatric patients).

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Number of Trauma Rooms – There will be a minimum of one trauma room in each ED. The maximum number of trauma rooms planned for an emergency department will be determined using a Poisson process with a capacity factor of 97.5 percent. The arrival rate used in the Poisson process calculation will be:

- a) 10.0 percent of the average number of projected ED patient visits per day ($0.10 \times$ the number of projected annual visits/365) OR
- b) The projected average number of trauma patient visits per day as determined by statistical analysis of recent historical data.

The service time used in the Poisson process calculation will be:

- a) 4.0 hours OR
- b) The average trauma treatment time as determined by statistical analysis of data from the most recent one year time period. The trauma treatment time is defined as the time from patient entry to a trauma room to patient disposition by the provider (Trauma treatment time does not include the post treatment wait time from disposition to discharge/admission/transfer).

3.5.4. PROGRAM DATA REQUIRED:

- How many annual ER visits are projected?
- How many FTE providers are projected?
- How many nurse managers are projected?
- How many FTE nursing staff is projected?
- How many NCOIC/LCPO/LPO/SMT are projected?
- How many officers or officer equivalents are projected?
- How many staff will require a private office?
- How many staff will require a cubicle?
- How many staff will require a locker?
- How many FTEs on peak shift are projected?
- How many FTE secretaries are projected?
- How many mobile x-ray carts are projected?
- How many crash carts are projected?
- Is interior gas cylinder storage required?
- Will a pediatric playroom be required?
- How many negative pressure isolation rooms will be required?
- Is a procedure room required?
- Is a positive pressure isolation room required?
- Will there be vending machines in the staff lounge?
- Will an on-call room be required?
- Is a satellite laboratory required?
- Will the projected ER have Level I or Level II service?
- Will the projected ER have Level III service?
- Will the projected ER have Level IV service?
- Will the projected ER have ambulance service?
- Will there be a Residency Program?
 - Will there be a Residency Program Director?
 - Will there be a Residency Program Secretary?
 - How many Residents are projected?
 - How many Residency Staff require a private administrative office?
 - How many Residency Administrative Staff cubicles are required?

NOTE: GP indicates that a guideplate exists for that particular Room Code.

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m ²	nsf	

3.5.5. SPACE CRITERIA:

FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m ²	nsf	

RECEPTION AREAS (Functions common to ALL levels of emergency care unless otherwise noted)

Waiting Area	WRC01	5.57	60	Minimum. 16 nsf per space; 25 nsf per handicapped space. Program 3 spaces per exam room. 5% of total number of spaces to be dedicated to handicapped spaces. May be subdivided to segregate post-triage patients and pediatric play area.
Pediatric Playroom (GP)	PLAY1	9.29	100	One per ER.
Reception Area	N/A	N/A	N/A	See individual Level of Emergency Care areas.
Public Toilets	N/A	N/A	N/A	Space provided for in the Common Areas Section 6.1
Exam/Screening (Triage)(GP)	EXRG5	11.15	120	Two per every increment of 20,000 projected annual emergency visits. Minimum two spaces; maximum six.

PATIENT AREAS: (Functions common to ALL levels of emergency care unless otherwise noted)

Trauma Room	TRET3	37.16	400	Minimum of one. The maximum number of trauma rooms will be determined by 10 percent of the average daily visit volume (0.1 x projected annual visits/365). The arrival rate and service time parameters may be modified by detailed statistical analysis. Round up at .75(?)
Exam Room	EXER1	13.01	140	The number of exam rooms will be determined by 90 percent of the average daily visit volume (0.9 x projected annual visits/365). Round up at .50.
Isolation Exam	EXRG6	13.01	140	Negative pressure. Minimum one. Infection control risk assessment is required to determine total requirement. Subtract the number of isolation rooms from the total number of exam rooms.
				Positive pressure. Infection control risk analysis is required to determine total requirement. Subtract the number of isolation rooms from the total number of exam rooms.
Isolation Toilet (GP)	TLTU1	4.65	50	One per isolation room.

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		m ²	nsf	

PATIENT AREAS: (Functions common to ALL levels of emergency care unless otherwise noted) Continued:

Staff Hand Washing Sink	SINK1	3.72	40	Includes linen hamper and cart equipment.
Family Consultation/Interview	OFDC2	11.15	120	One per department.
Patient Toilet (GP)	TLTU1	4.65	50	May also be used as specimen toilet. Minimum of one. Add new criteria, set to number of exam rooms.

STAFF AND ADMINISTRATION AREAS: (Functions common to ALL levels of emergency care unless otherwise noted)

Emergency Services Director	OFA01	11.15	120	Private office, Standard Furniture.
	OFA02			Private office, System Furniture.
Nurse Manager	OFA01	11.15	120	Private office, Standard Furniture.
	OFA02			Private office, System Furniture.
NCOIC/LCPO/LPO/SMT Office	OFA01	11.15	120	Per projected FTE.
	OFA02			
Nurse Workroom	WRCH1	11.15	120	Minimum. Add 40 nsf for every nursing staff over 4. Does not include nurse manager.
Secretary w/Visitor Waiting	SEC01	11.15	120	Per projected FTE secretary.
Provider Office	OFD01	11.15	120	If only one provider, Standard Furniture. Do not include Emergency Services Director.
	OFD02			If only one provider, System Furniture. Do not include Emergency Services Director.
	OFA03	5.57	60	System Furniture Cubicle. One for each provider projected during the peak shift.
Administrative Cubicle	OFA03	5.57	60	Per projected Administrative FTE requiring a dedicated cubicle. See Section 2.1.
Conference/Classroom (GP)	CRA01	23.23	250	Minimum. If EM residency- program projected add 10 nsf per resident greater than 10. Consider consolidating with staff lounge if no EM residency program at MTF. Maximum of 400.
On-Call Room (GP)	DUTY1	11.15	120	If in clinic concept of operations.
On-Call Toilet/Shower	TLTS1	6.50	70	If in clinic concept of operations.

Emergency Reference Library	LIBB1	3.72	40	One per department.
Copy Room	RPR01	9.29	100	One per department. Copier/Fax/Mailbox Distribution

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
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Forms/Literature Storage	SRS01	9.29	100	One per department
Medication Preparation Station	MEDP1	9.29	100	One per department
Central Alarm/Security	COM03	4.65	50	Locate either in ER or in Facility Management, 50 nsf Clinic, 200 nsf Hospital, and 300 nsf Med Center. Or may program a satellite alarm center at 50 nsf.
Staff Changing Locker Room (GP) Male Female	LR002	9.29	100	Minimum. Add 6.5 nsf for each greater than 10 projected for Emergency Services & Ambulance/Transportation Service. Divide space equally for male and female locker rooms.
Staff Shower	SHWR1	5.57	60	Program one for each male and female staff locker room.
Staff Lounge (GP)	SL001	13.01	140	Minimum. Add 20 nsf if vending machines included in lounge. Add 5 nsf per FTE greater than 10 on duty during peak shift. See Section 6.1.
Staff Toilets (GP)	TLTU1	4.65	50	Minimum of one. Program an additional one for each increment of 15 staff on peak shift.

CLINIC SUPPORT AREAS: (Functions common to ALL levels of emergency care unless otherwise noted)

Clean Utility (GP)	UCCL1	11.15	120	For up to 15 exam rooms.
		13.94	150	If 16 -30 exam rooms.
		16.72	180	If greater than 30 exam rooms.
Soiled Utility (GP)	USCL1	8.36	90	For up to 15 exam rooms.
		11.15	120	If 16 -30 exam rooms.
		13.94	150	If greater than 30 exam rooms.
Satellite Lab w/Blood Drawing Chair (GP)	LBSP1	9.29	100	One per clinic if in clinic Concept of Operations.
Mobile Rad Unit Alcove	XRM01	3.72	40	Per dedicated mobile x-ray cart.
Crash Cart Alcove	RCA01	3.72	40	Per dedicated crash cart.
Interior Gas Cylinder Storage	SRGC2	1.86	20	Full cylinders if required in ED.
				Empty cylinders.
Ice Machine	ICE01	1.86	20	One per department.

Additional Functions Required for Levels I & II Emergency Care/Full-Scale Definitive Emergency Management

Secured Holding Room	OPMH4	11.15	120	One per department. Note: this room may be replaced by a redesigned Psych Exam room).
Walk-In Patient Reception/Control (GP)	RECP1	22.30	240	For Level I facility. Program one per ED.
Ambulance Reception/Team Center	NSTA1	18.58	200	One per department.

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FUNCTION	Room Code	AUTHORIZED		PLANNING RANGE/COMMENTS
		m ²	nsf	
Security Control Area	COM03	11.15	120	One per department if FTE security personnel assigned.
Litter/Wheelchair Storage	SRLW1	9.29	100	One per dept, can split 20 nsf near patient entrance
Supplies/Equipment Storage	SRS01	18.58	200	One per department
Decontamination Suite (GP)	NBCD1	44.59	480	One per department

Additional Functions Required for Level III Emergency Care/24-Hour Initial Emergency Management

Walk-In Patient Reception/Control (GP)	RECP1	11.15	140	One per department.
Ambulance Reception/ Team Center	NSTA1	13.94	150	One per department.
Litter/wheelchair storage	SRLW1	5.57	60	One per department, can split 20 nsf near patient entrance.
Supplies/Equipment Storage	SRS01	9.29	100	One per department.
Decontamination Shower Room (GP)	NBCD2	11.15	120	One per department.

Additional Functions Required for Level IV Emergency Care/Limited Initial Emergency Management/Acute Care

Walk-In Patient Reception/Control (GP)	RECP1	11.15	140	One per department.
Ambulance Reception/Team Center	NSTA1	13.01	140	One per department (if ambulance service authorized).
Litter/wheelchair storage	SRLW1	3.72	40	One per department, can split 20 nsf near patient entrance.
Supplies/Equipment Storage	SRS01	9.29	100	One per department.
Decontamination Shower Room (GP)	NBCD2	11.15	120	One per department.

Functions Required for Ambulance Service

Ambulance Dispatch	COM02	9.29	100	Consider consolidating with Security/Communications Center
Emergency Response Kits/Supply Storage	SRSE1	1.39	15	Per ambulance assigned
Flammable/Hazardous Material Storage	SRHM1	0.93	10	Minimum for flammable storage locker, plus. two nsf per each additional ambulance assigned.
Mass Casualty Storage	SRS01	11.15	120	Can be increased based on Mission/Concept of Operations
Interior Gas Cylinder Storage	SRGC2	1.86	20	Minimum. Can be combined with main ER gas cylinder storage.
Ambulance Shelter	AMB01	46.45	500*	For first ambulance. Add 400 gsf for each additional ambulance assigned.

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		m ²	nsf	
Ambulance Garage	AMB02	50.17	540*	For first ambulance. Add 420 gsf for each additional ambulance assigned.

* Allowance is programmed as gross square feet (gsf).

Functions which are required for Residency Education in Emergency Medicine:

RESIDENCY STAFF AND ADMINISTRATIVE AREAS				
Residency Program Director (GP)	OFA01	11.15	120	Standard Furniture - One per director of a Residency Program.
	OFA02			System Furniture - One per director of a Residency Program.
Secretary w/Visitor waiting.	SEC01	11.15	120	One per Residency Program projected FTE secretary position.
Private Office	OFA01	11.15	120	Standard Furniture - One per projected FTE that requires a private office.
	OFA02			System Furniture - One per projected FTE that requires a private office.
Administrative Cubicle	OFA03	5.57	60	Provide 60 nsf per projected FTE administrative personnel requiring a dedicated cubicle.
Resident Cubicle	OFA03	5.57	60	Minimum. 60 nsf per projected resident.
Library	LIBB1	13.01	140	One per Residency Program.
Resident Exam Room	EXER1	13.01	140	One per Resident minus the two monitored exam rooms.
Monitored Exam Room - Subject & Observer room	EXER1	13.01	140	Provide two exam rooms per residency program, and one CMP02. These rooms use cameras and videotapes.
	CMP02	5.57	60	One room can support two exam rooms.
Preceptor/Consult Room	OFDC1	11.15	120	One per eight staff physicians per concept of operations.